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as an sugraver and the sufficiently high authorities consultred in the matter hasequen sur some selece

frohat Shad found out.

In order to make the matter char Finll rudravor to replan the difference between mines and the processes now in general use for harden mg ders for reproducing rugrang your must of wicessity understand that a stree surshard by any of the processes now in use are orienzed morror tess on the surface, in The eyandr of pottossum met level the result is a sprace of whether four white frosting, this frosting or oxidedize is universal and attacks grainer autoand polished surfaces alike. Such a surface is ruturely forrigh to a soft der. It may be removed and a polish rffected by such mithuds in grurral as apply to a soft der. But you can not restore the surface of a gravers out receptowith a gravurr, and it is simple imposeble to cut a hard strel die with agravure. You may polish it, but a gravure cut represents a surfair and effect of its own and can not be remedescept

by a repetition of the original means Iwould venture to state that the sugraving now applied to coins has been supply sported in the hardrung of the huband dur. If you wish to test the value of that assistion Ist our of your rugravers. rrent our single bine on a gold, silver, or mokels or copper com and then and comparr it with the same line reproduced from a stamp and Anotr which is sharfe and effective and shows up for it full value, and which is not. Furthermore if you think your inthools and processes represent the millemme of yerllener I would suggest another test; Funch a flat strel surface to a high polish, thru rugrave or it any small subject, an ragler say, shader it up as close and four as a watch case or grurly rugrower would Et would be a good idea to how e aerotele case angraver dont) and then harden et unthe your best skill and find the same highly funstred the and effective bird if you can. But that is reactly what I the do. brung a dir out of therfore reactly as it went in, that is, harden a die and yet perserve intact surry particle of the effect applied to the soft dir. to the soft der.

To reproduce ingraving or watch cases and fruity has bress a standing unpossibility upoto

present time nothing has been produced on the market as yet but a poor immutation that sells as stampted work.

With a hub or dir that must be femsherd uft after it is hardrurd you affinited to such ornamental effects as are now used. Toaspurs toanything like an artistrorasult saturdy the growers andall its variation arr barried out, for a funding reffect. Morrover such a departure as I suggest would represent a graat saving of time, and a vast unprovements in the results produced in the dis sinking department, as in my process the design would be fundered up complets on the soft hub, there would be no use-

Essity of polishing rither the hardried hubor der, Mid as the sugrower would have a great

greater command over softsteel the results would be proportionally better.

You will find ruclosed a general descripture of my process It is in the patent former in the matter.
Respet yours Thomas F Hanry officer yet, but Iwill trust to your con-

246 6.19 the St New York City

I will not attrupt a detailed description but in bring The dir is alretro-plated with a thick should of weekle, copper, silver, or gold, or any combination of the instalourntrourd, micker is prehapsiler best untal touse in most cases. a thuck shill of makele of, say about 164 or 100 of an inch thick may be first deposited on the die there a light coating of silver, or selver and coffer, ver that. The plated due is then packed in bour-black or a combination of bour-black, plumbago, un au vron erneible and placed in acharcoal firs, prefrably. When the proper heat for hardening is attained the chais bytices out and plunged in cold water Tome underswable portion of the plating is thrurrowed to repose a portion of the strel towatelettle color and the der confully reheated in an iron crimille or Cos trompering it is then plunged in water The shell may be prival, lefted, or torn off, and the result is a hard, perfectly finished dir, the shell receiving the oxide that would other-

insrattact the surface of the stress.

295 RG104 E-1 Box 159 New York Sept. 16.1889 Shomae I, Haney Inthis explanation of his patent for hardening Dris + protecting their surface.

[Abstract:] Further explanation of his patent for hardening Dies & protecting their surface.

New York, September 15, 1889

Superintendent of the Mint

Sir;

I am inclined to differ as to the misapprehension referred to in your letter of the 13th inst. I think my own experience as an engraver and the sufficiently high authorities consulted in the matter has given me some idea of what I had found out.

In order to make the matter clear I will endeavor to explain the difference between mine and the processes now in general use for hardening dies for reproducing engraving.

You must of necessity understand that steel dies hardened by any of the processes now in use are oxidized more or less on the surface, in the cyanide of potassium method the result is a specie of fine white frosting. This frosting or oxidize is universal and attacks gravure cuts and polished surfaces alike. Such a surface is entirely foreign to a soft die. It may be removed and a polish effected by such methods in general as apply to a soft die. But you can not restore the surface of a gravure cut except with a gravure, and it is simply impossible to cut a hard steel die with a gravure. You may polish it, but a gravure cut represents a surface and effect of its own and can not be reused except by a repetition of the original means. I would venture to state that the engraving now applied to coins has been spoiled in the hardening of the husband die. If you wish to test the value of that assertion, but one of your engravers recut one single line on a gold, silver, or nickel or copper coin and then compare it with the same line reproduced from a stamp and note which is sharp and effective and shows up for its full value, and which is not. Further more if you think your methods and processes represent the millennium of excellence I would suggest another test: Finish a flat steel surface to a high polish, then engrave on it any small subject, an eagle say, shade it up as close and fine as a watch case or jewelry engraver would (it would be a good idea to have a water case engraver do it) and then harden it with your best skill and find the same highly finished and effective bird if you can. But that is exactly what I do. I bring a die out of the fire exactly as it went in. That is, harden a die and yet preserve intact very particle of the effect applied to the soft die.

To reproduce engraving on watch cases and jewelry has been a standing impossibility up to present time nothing has been produced on the market as yet but a poor imitation that sells as stamped work.

With a hub or die that must be finished up after it is hardened you are limited to such ornamental effects as are now used. To aspire to anything like an artistic result the gravure and all its variation are barred out, for a finishing effect.

Moreover such a departure as I suggest would represent a great saving of time, and a vast improvement in the results produced in the die-sinking departments, as in my process the design

would be finished up complete on the soft hub, there would be no necessity of repolishing either the hardened hub or die. And as the engraver would have a greater command over soft steel the results would be proportionately better.

You will find enclosed a general description of my process. It is in the patent office yet, but I will trust to your confidence in the matter.

Respt. Yours, Thomas F. Haney 246 E. 19th St. New York City

[Enclosed note:]

I will not attempt a detailed description but in brief.

The die is electro-plated with a thick shell of nickel, copper, silver, or gold, or any combination of the methods mentioned, nickel is perhaps the best metal to use in most cases. A shell of nickel of, say about 1/64 or 1/100 of an inch thick may be first deposited on the die then a light coating of silver, or silver and copper, over that. The plated die is then packed in bone-black or a combination of bone-black and plumbago, in an iron crucible and placed in a charcoal fine, preferably.

When the proper heat for hardening is attained the die is lifted out and plunged in cold water. Some undesirable portion of the plating is then removed to expose a portion of the steel to watch the color and the die carefully re-heated in an iron crucible or box until the proper color is produced for tempering. It is then plunge in water or oil.

The shell may be pried, lifted, or torn off, and the result is a hard, perfectly finished die, the shell receiving the oxide that would otherwise attack the surface of the steel.

Thomas & Harvey